



PowerKnife System PKS®

The manufacture of profiled mouldings is an important area of profile processing. Profiled mouldings are used, for instance, in the floor area as skirting boards, in the door area as frame profiles, and in cabinetry as crown or decorative mouldings. Such products are usually manufactured through four-sided processing on through-feed machines and pose specific requirements to a tooling system.

- Profile changes need to be implemented quickly in supplier factories. This means that the user himself must be able to profile and regrind the tooling system.
- The spreading of MDF lining profiles requires the use of wear-resistant tungsten carbide knives.
- If high production volumes are required, the tool system needs to be either jointable or, in the case of new machine generations, also be HSC-suitable, i.e. suited for high rotation speeds up to $n = 12,000$ rpm.
- Furthermore, the number of staff occupied with tool preparation must not be too high, as that staff is needed for the actual production of the mouldings.

Specially for these high requirements in profile moulding production, Leitz has developed a very user-friendly and highly efficient knife system, called PowerKnife System, or simply PKS®.

PKS® is a further development of the Leitz MicroSystem, which has been providing valuable services over the years. It is compatible with all back-serrated profile cutterheads with 60° serration, whether with bore-hole or HSK. The system consists of a tungsten carbide blank knife and a backing plate from hardened steel. Both parts are form-fitting via a serration, but can be separated from each other. The backing plate is secured in the serration of the cutterhead via its back serration.

This system offers major advantages compared to tipped knives with soldered tungsten carbide edge and different, two-part knife designs:

- To attain a maximum degree of centric running, the knives are profiled or reground when installed, machining the tungsten carbide edge and the steel backing plate separately with the appropriate grinding wheel. The backing plate is profiled only once, while the tungsten carbide edge is reground several times and can be replaced separately. Thanks to the mono-material machining of tungsten-carbide and steel, the grinding wheel consumption, the processing time and the tool cost are reduced.
- The regrinding zone of the tungsten carbide knife is 10.8 mm, that means approx. 40 re-sharpenings on average.
- The readjustment area of the knife system is pre-defined by design. It is not possible to extract the knife too far from the tool. This ensures a safe operation of the system in all settings.

- The form-fitting connection between the tungsten carbide knives and the backing plate via just one serration ensures that the parts are in contact over the whole surface, thus enabling maximum positioning accuracy, as one serration by definition does not lead to pitch errors.
- The comparatively large increments of 1.8 mm when adjusting the tungsten carbide knife enable 6 to 8 re-sharpenings in one installation position. In relation to the overall single performance time of one knife, this results in reduced mounting efforts for shifting the knives.
- The two-part design enables using more wear-resistant tungsten carbide qualities compared to brazed tungsten carbide knives, leading to significantly increased performance times.
- Only sub-micro grain qualities are used as tungsten carbide. The face is produced with mirror finish. When combined, both lead to extremely sharply ground cutting edges for a perfect surface finish.

The PowerKnife System PKS® is available as

- non-profiled blank knives with the heights 50, 60 and 70 mm for grinding profiles to a profile depth of 33 mm
- ground knives with a height of 40 mm for planing or jointing. This knife height is matched to the tool diameters provided for jointing in the machine.

Only sub-micro grain qualities are used as tungsten carbide:

- TC-30F for solid wood, preferable hardwood
- TC-10F for wood materials such as MDF, WPC.

The knives can be jointed in the machine. When used with HSK tools, it was shown that the accuracy ground is sufficient to allow a Z2 tool at 12,000 min⁻¹, e.g. in MDF at a feed rate of 50 m/min, to attain finish quality even without jointing. Productivity can be increased still further through parallel profiling of several mouldings with subsequent separation. PKS® with cutting widths of up to 240 mm are available for this.

Even if profiling by the user is sometimes necessary in so-called "snapshots", it is beneficial to use the competence and equipment of a specialist for the preparation of the tools. Leitz, with its regrinding centres in many countries of the world, offers exclusive service in this regard. The tools are mounted, ground and measured. The profile-specific measuring points are defined together with the user and the measured data are documented on an accompanying tool card. The tools get back into the machine directly via a re-usable transport container. The machine staff can therefore concentrate much more efficiently on their actual task – the production of mouldings. This service package is extended still further by the integration of the CAD profile data of the user in the grinding programs of the service centre, as well as a telephone hotline for urgent cases.



PowerKnife System PKS®
Tungsten carbide blank knife with backing plate for back-serrated profile cutterheads

PKS®: New condition

PKS®: Reground several times, in end position

Leitz GmbH & Co. KG
Leitzstrasse 2
73447 Oberkochen, Germany
Postfach 1229
73443 Oberkochen, Germany
Tel. +49 (0) 73 64/95 00
Fax +49 (0) 73 64/95 06 62
leitz@leitz.org
www.leitz.org

Leitz GmbH & Co. KG
Leitzstrasse 80
4752 Riedau, Austria
Tel. +43 (0) 77 64/82 00 0
Fax +43 (0) 77 64/82 00 111
office.leitz@rie.leitz.org
www.leitz.org



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